FURUKAWA ELECTRIC

INDUSTRIAL CABLE CO., LTD.

Spec. No.: CGS-140005

SPECIFICATION

FOR

LAN with
halogen-free thermoplastic compound inner sheathed,
braid armoured and
halogen-free thermoplastic compound outer sheathed cable

1. Citation standard

IEC 60092-350 Electrical installations in ships – Part 350: General construction and test methods of power, control and instrumentation cable for shipboard and offshore applications

FURUKAWA standard

2. Construction

Construction shall be in according with attached table.

2.2 Construction of symbols and materials

Table 1 Construction of symbols and materials

Item	Symbols	Materials
LAN	OKTP-6A-SWA24X4P-SA	LAN cable in according to ANSI/TIA-568-C.2 for Category 6A.
Inner sheath	I	Halogen-free thermoplastic compound in according to IEC 60092-359 for SHF1
Armour	O	Plain annealed copper wire braid
	C	Galvanized steel wire braid
Outer Sheath	I	Halogen-free thermoplastic compound in according to IEC 60092-359 for SHF1

3. Length marking

(1) Symbol

(2) ○○○M (Winding start number 0)

4. Routine tests

(1) Appearance test (On sample)

(2) Construction test (On sample)

(3) Conductor resistance (Manufacture length)

(4) Insulation resistance (Manufacture length)

(5) A.C. dielectric strength (Manufacture length)

(6) Mutual capacitance (Manufacture length)

(7) Characteristic impedance (Manufacture length)

5. Packing

The completed cable shall be wound on a strong reel and lagged securely in order to protect from any possible damage during transportation.

6. Cross-section of cable

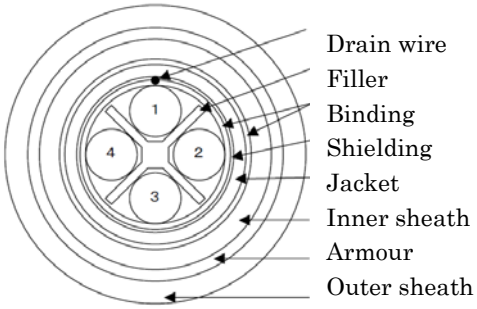

Table 2 Twisting

Pair No.	First	Second
1	Blue	White(Blue)
2	Orange	White(Orange)
3	Green	White(Green)
4	Brown	White(Brown)

Attached table

OKTP-6A-AWG24X4P-SA/IOI, OKTP-6A-AWG24X4P-SA/ICI

Construction

Item			specification
conductor	Material		Plain annealed copper wire
	Diameter	mm	0.545
Insulation	Material / Color		PE / Reference to Table2
	Nominal thickness	mm	0.22
	Diameter	mm	0.99
Twisting			Reference to Table2
Stranding			Reference to cross-section of cable
Filler			Cross filler
Binding			Plastic Tapes
Drain wire			Tinned annealed copper wire
Shielding			Aluminum backed polyester tape
Jacket	Materials / Color		PVC / Black
	Nominal thickness	mm	0.4
	Diameter	mm	7.2
Binding			Plastic tape
Inner sheath	Material / Color		SHF1 / Black
	Nominal thickness	mm	1.1
	Diameter	mm	11.6
Diameter of braid wire		mm	0.3
Outer Sheath	Material / Color		SHF1 / Black
	Nominal thickness	mm	0.9
Approx. overall diameter		mm	15.0
Approx. net weight		kg/km	280
Max. length		m	80

Electrical characteristic

Item		specification
Max. Conductor resistance(at 20℃)	Ω/km	93.8
Min. Insulation resistance	MΩ･km	2500
Dielectric strength	V･min.	350
Max. mutual capacitance (at 1kHz)	PF/m	56
Characteristic impedance(at 1~500MHz)	Ω	100±15

Item	Specification(Formula)	Specification(Reference)
Attenuation (at 20℃) (dB/100m)	ＩＮＳＥＲＴＩＯＮ ＬＯＳＳ $\leqq 1.82\sqrt{f}+0.0091\cdot f+\frac{0.25}{\sqrt{f}}$	Less than 2.1 (at 1.0 MHz) Less than 3.8 (at 4.0 MHz) Less than 5.3 (at 8.0 MHz) Less than 5.9 (at 10.0 MHz) Less than 7.5 (at 16.0 MHz) Less than 8.4 (at 20.0 MHz) Less than 9.4 (at 25.0 MHz) Less than 10.5 (at 31.25MHz) Less than 15.0 (at 62.5 MHz) Less than 19.1 (at 100.0 MHz) Less than 27.6 (at 200.0 MHz) Less than 31.1 (at 250.0 MHz) Less than 34.3 (at 300.0 MHz) Less than 40.1 (at 400.0 MHz) Less than 45.3 (at 500.0 MHz)
Near End Crosstalk (dB/100m)	ＮＥＸＴ $\geqq 44.3-15\log(f/100)$	More than 74.3 (at 1.0 MHz) More than 65.3 (at 4.0 MHz) More than 60.8 (at 8.0 MHz) More than 59.3 (at 10.0 MHz) More than 56.2 (at 16.0 MHz) More than 54.8 (at 20.0 MHz) More than 53.3 (at 25.0 MHz) More than 51.9 (at 31.25MHz) More than 47.4 (at 62.5 MHz) More than 44.3 (at 100.0 MHz) More than 39.8 (at 200.0 MHz) More than 38.3 (at 250.0 MHz) More than 37.1 (at 300.0 MHz) More than 35.3 (at 400.0 MHz) More than 33.8 (at 500.0 MHz)
Power Sum Near End Crosstalk (dB/100m)	ＰＳＮＥＸＴ $\geqq 42.3-15\log(f/100)$	More than 72.3 (at 1.0 MHz) More than 63.3 (at 4.0 MHz) More than 58.8 (at 8.0 MHz) More than 57.3 (at 10.0 MHz) More than 54.2 (at 16.0 MHz) More than 52.8 (at 20.0 MHz) More than 51.3 (at 25.0 MHz) More than 49.9 (at 31.25MHz) More than 45.4 (at 62.5 MHz) More than 42.3 (at 100.0 MHz) More than 37.8 (at 200.0 MHz) More than 36.3 (at 250.0 MHz) More than 35.1 (at 300.0 MHz) More than 33.3 (at 400.0 MHz) More than 31.8 (at 500.0 MHz)

Item	Specification(Formula)	Specification(Reference)
Attenuation to crosstalk Ratio, far-end (dB/100m)	ＡＣＲＦ ≧27.8-20log(f/100)	More than 67.8 (at 1.0 MHz) More than 55.8 (at 4.0 MHz) More than 49.7 (at 8.0 MHz) More than 47.8 (at 10.0 MHz) More than 43.7 (at 16.0 MHz) More than 41.8 (at 20.0 MHz) More than 39.8 (at 25.0 MHz) More than 37.9 (at 31.25MHz) More than 31.9 (at 62.5 MHz) More than 27.8 (at 100.0 MHz) More than 21.8 (at 200.0 MHz) More than 19.8 (at 250.0 MHz) More than 18.3 (at 300.0 MHz) More than 15.8 (at 400.0 MHz) More than 13.8 (at 500.0 MHz)
Power sum attenuation to crosstalk ratio, far-end (dB/100m)	ＰＳＡＣＲＦ ≧24.8-20log(f/100)	More than 64.8 (at 1.0 MHz) More than 52.8 (at 4.0 MHz) More than 46.7 (at 8.0 MHz) More than 44.8 (at 10.0 MHz) More than 40.7 (at 16.0 MHz) More than 38.8 (at 20.0 MHz) More than 36.8 (at 25.0 MHz) More than 34.9 (at 31.25MHz) More than 28.9 (at 62.5 MHz) More than 24.8 (at 100.0 MHz) More than 18.8 (at 200.0 MHz) More than 16.8 (at 250.0 MHz) More than 15.3 (at 300.0 MHz) More than 12.8 (at 400.0 MHz) More than 10.8 (at 500.0 MHz)
Return Loss (dB/100m)	ＲＬ 20+5log(f) (1≦ｆ＜10MHz) 25 (10≦ｆ＜20MHz) 25-7log(f/20) (20≦ｆ≦500MHz)	More than 20.0 (at 1.0 MHz) More than 23.0 (at 4.0 MHz) More than 24.5 (at 8.0 MHz) More than 25(at10.0～20.0 MHz) More than 24.3 (at 25.0 MHz) More than 23.6 (at 31.25MHz) More than 21.5 (at 62.5 MHz) More than 20.1 (at 100.0 MHz) More than 18.0 (at 200.0 MHz) More than 17.3 (at 250.0 MHz) More than 16.8 (at 300.0 MHz) More than 15.9 (at 400.0 MHz) More than 15.2 (at 500.0 MHz)

Item	Specification(Formula)	Specification(Reference)
Propagation Delay (ns/100m)	Ｐｒｏｐ.Ｄｅｌａｙ $\leqq 534+\frac{36}{\sqrt{f}}$	Less than 570 (at 1.0 MHz) Less than 552 (at 4.0 MHz) Less than 547 (at 8.0 MHz) Less than 545 (at 10.0 MHz) Less than 543 (at 16.0 MHz) Less than 542 (at 20.0 MHz) Less than 541 (at 25.0 MHz) Less than 540 (at 31.25MHz) Less than 539 (at 62.5 MHz) Less than 538 (at 100.0 MHz) Less than 537 (at 200.0 MHz) Less than 536 (at 250.0 MHz) Less than 536 (at 300.0 MHz) Less than 536 (at 400.0 MHz) Less than 536 (at 500.0 MHz)
Ｄｅｌａｙ Ｓｋｅｗ (ns/100m)	ＳＫＥＷ ―――――――――――	Less than 45.0 (at 1～500.0 MHz)
Tranverse conversion loss (dB/100m)	ＴＣＬ $\geqq 30-10\log(f/100)$	More than 40.0 (at 1.0 MHz) More than 40.0 (at 4.0 MHz) More than 40.0 (at 8.0 MHz) More than 40.0 (at 10.0 MHz) More than 38.0 (at 16.0 MHz) More than 37.0 (at 20.0 MHz) More than 36.0 (at 25.0 MHz) More than 35.1 (at 31.25MHz) More than 32.0 (at 62.5 MHz) More than 30.0 (at 100.0 MHz) More than 27.0 (at 200.0 MHz) More than 26.0 (at 250.0 MHz) More than 25.2 (at 300.0 MHz) More than 24.0 (at 400.0 MHz) More than 23.0 (at 500.0 MHz)
Equal level transverse conversion loss transfer loss (dB/100m)	ＥＬＴＣＴＬ $\geqq 35-20\log(f/100)$ （１≦ｆ≦３０ＭＨｚ）	More than 35.0 (at 1.0 MHz) More than 23.0 (at 4.0 MHz) More than 16.9 (at 8.0 MHz) More than 15.0 (at 10.0 MHz) More than 10.9 (at 16.0 MHz) More than 9.0 (at 20.0 MHz) More than 7.0 (at 25.0 MHz) More than 5.5 (at 30.0 MHz)